SITY OF CALIFORNIA, BERKELEY

Final Report on NAG5-646: Analysis of BEARS and CUBS Data

The purpose of this effort was to analyze the data collected by two experiments conducted form two test flights of Black Brant XII (WT 12.041 and WT 12.042). These experiments were developed in a significantly shorter time than most "conventional" sounding rocket programs from any discipline. BEARS obtained day airglow spectra from 980 - 1360 Å spectral range at approximately 1.5Å resolution from 150 - 960 km altitude range. Since the fourth stage of the Black Brant XII had a burn through, a second test flight was planned and we fielded the CUBS payload. CUBS used a spectrophotometer to obtain altitude profiles of several thermospheric and exospheric emissions.

Both experiments have been highly successful. BEARS was the basis of Dr. Daniel M. Cotton's Ph. D. thesis at the University of California, Berkeley. Similarly, CUBS is the cornerstone of Mr. Brett Bush's Ph. D. Dissertation. Both Dr. Cotton and Mr. Bush were awarded the prestigious NASA Graduate Stdent Research Program (GSRP) fellowship for their efforts.

A number of publication have resulted from the data obtained by BEARS ad CUBS. They have revealed new insights into the excitation mechanism of Far Ultraviolet (FUV) and Extreme Ultraviolet (EUV) radiation from the upper thermosphere. The publications listed below describe these results.

1 List of Publications and Talks in Scientific Meetings

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Chakrabarti S., D. M. Cotton, M. Lampton, O. H. W. Siegmund, R. Link, and G. R. Gladstone, An EUV spectrometer for atmospheric remote sensing, *Proc. SPIE*, 1159, 452, 1989.

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Cotton, D. M. and S. Chakrabarti, BEARS: The Berkeley EUV airglow rocket spectrometer, *Appl. Optics*, 31, 5852–5864, 1992.

Chakrabarti, S., D. M. Cotton, G. R. Gladstone, and W. K. Tobiska, A Preliminary Analysis of Atomic Oxygen Dayglow Using Solar EUV Measurements, *Adv. Space Res.*, 13, 261, 1993.

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Cotton, D. M., G. R. Gladstone, and S. Chakrabarti, Sounding Rocket Observations of a Hot Atomic Oxygen Geocorona, *J. Geophys. Res.*, in press 1993.

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